Tutorial - Week 3

# Objectives:

This tutorial will cover:

1. Entity-Relationship (ER) modelling review
2. Case study – Use a case study to design a conceptual model
3. Convert the conceptual model to a logical model
4. Introduce the notion of physical model – **complete as homework**

# Exercises:

### ER Review – selected concepts

**NOTE for students:** *This is a brief summary of selected concepts taught in lectures 3 and 4. The lectures contain detailed content related to these and many more key concepts. These notes should be considered quick revision instead of the sole resource for the course material.*

* + Entity, weak entity
  + Attribute
  + Business rules to relationships – key constraints and participating constraints

### Consider the following case study:

A cinema chain operates a number of cinemas. Each cinema has several theatres, numbered starting from 1. The chain keeps track of the size (in meters) and seating capacity of every theatre, as well as whether the theatre offers the Gold Class experience.

连锁电影院经营着许多电影院。每家电影院都有几个剧院，从1号开始编号。这家连锁公司一直在跟踪每个剧院的大小(以米为单位)和座位容量，以及剧院是否提供黄金级体验。

The cinema chain owns hundreds of movie projectors – both film projectors (16 mm and 35 mm) and digital projectors (2D and 3D). The cinema chain stores key information about each projector, namely its serial number, model number, resolution and hours of use. Each movie theatre has space for a single projector; technicians must be able to identify which theatre each projector is currently in use.

这家连锁影院拥有数百台电影放映机，既有16毫米和35毫米的电影放映机，也有2D和3D的数字放映机。这家连锁影院存储了每个投影机的关键信息，即序列号、型号、分辨率和使用时间。每个电影院都有一个放映机的空间;技术人员必须能够识别每个放映机目前正在使用的影院。

A wide range of movies are shown at these cinemas. The system should keep track of the last time a movie was shown in a particular theatre belonging to a particular cinema. The marketing

department needs to know the movie’s title and year of release, along with the movie’s rating (G,

PG, M, MA15+ or R18+).

这些电影院放映各种各样的电影。系统应该跟踪一部电影最后一次在属于特定影院的特定影院放映的时间。营销部门需要知道电影的名称、上映时间、电影等级(G、PG、M、MA15+、R18+)等。

Each cinema has a numeric ID, name and address. For cinemas that are not owned outright, the business also keeps track of yearly rent. The system needs to be able to generate weekly activity reports for the chain’s chief operating officer.

每个电影院都有一个数字ID、名字和地址。对于非全资拥有的影院，该业务还会跟踪年租金。该系统需要能够为连锁店的首席运营官生成每周的活动报告。

### TASK. Follow the steps to create a conceptual model in Chen’s notation:

1. Identify the entities
2. Form relationships between entities.
3. Apply constraints (key constraints and participation constraints) to the relationships.
4. Add attributes which describe the entities and relationships.
5. Finalise your conceptual model by marking weak entities, identifying relationships and key attributes.

Logical and physical modelling

### TASK. What needs to be changed to convert a conceptual design to a logical design?

1. TASK. Develop a logical design for the above case study.

*HINT: What will you change in the logical model to generate a physical model?*

## HOMEWORK

### TASK. Using MySQL Workbench create a physical E.R. model of the case study.